

RECEIVED  
RCF:vjs 03/03/09 999287.doc 307597.01  
CENTRAL FAX CENTER Attorney Reference Number 3382-67641-01  
MAR 03 2009 Application Number 10/826,971

Amendments to the Claims

1. (Currently Amended) In a computing device that implements a video encoder, a  
A method comprising:

with the computing device that implements the video encoder, encoding one or more  
video images, including processing run level information in a two-layer representation for a  
sequence of values for the one or more video images, wherein the processing includes processing  
run-level encoding a sequence of plural first-layer runs from the sequence of values as one or  
more second-layer runs and one or more second-layer levels; and

from the computing device that implements the video encoder, outputting a result of the  
encoding the one or more video images.

2.-3. (Cancelled)

4. (Original) The method of claim 1 wherein the values are frequency transform  
coefficients.

5. (Currently Amended) The method of claim 4 wherein the sequence of values is  
zigzag scanned using a scan pattern selected from among plural available scan patterns for  
variable-size blocks.

6. (Cancelled)

7. (Currently Amended) The method of claim 1 wherein each of the plural first-  
layer runs represents a run of zero or more zero values in the sequence of values.

8. (Previously Presented) The method of claim 1 wherein each of the one or more  
second-layer runs represents a run of zero or more insignificant-value first-layer runs.

9. (Previously Presented) The method of claim 1 wherein each of the one or more  
second-layer levels represents a single significant-value first-layer run.

10. (Previously Presented) The method of claim 1 further including processing at least some of the one or more second-layer runs using a separate Huffman code per second-layer run.

11. (Previously Presented) The method of claim 1 further including processing at least some of the one or more second-layer levels using a separate Huffman code per second-layer level.

12. (Previously Presented) The method of claim 1 further including processing a count of significant second-layer runs, wherein the count at least in part enables reduction in code table size and/or early termination of decoding.

13. (Cancelled)

14. (Currently Amended) The method of claim 68 wherein each of the plural first-layer levels represents a non-zero value in the sequence of values.

15. (Previously Presented) The method of claim 68 wherein each of the one or more second-layer runs represents a run of zero or more insignificant-value first-layer levels.

16. (Previously Presented) The method of claim 68 wherein each of the one or more second-layer levels represents a single significant-value first-layer level.

17. (Previously Presented) The method of claim 68 further including processing at least some of the one or more second-layer runs using a separate Huffman code per second-layer run.

18. (Previously Presented) The method of claim 68 further including processing at least some of the one or more second-layer levels using a separate Huffman code per second-layer level.

19. (Previously Presented) The method of claim 68 further including processing a count of significant second-layer levels, wherein the count at least in part enables reduction in code table size and/or early termination of decoding.

20. (Original) The method of claim 1 wherein the processing includes using embedded Huffman code tables for the information in the multi-level representation, and wherein the embedded Huffman code tables are shared for plural different variable-size blocks.

21. (Original) The method of claim 1 wherein the processing includes using zoned Huffman code tables for the information in the multi-level representation.

22. (Currently Amended) In a computing device that implements a video processing tool decoder, a method comprising:

with the computing device that implements the video decoder, decoding one or more video images, including, for each of plural sequences of frequency transform coefficients for the one or more video images,

processing run level information for the sequence in a two-layer representation, including processing one or more first layer runs as run-level decoding one or more second-layer runs and one or more second-layer levels that represent one or more first-layer runs for the sequence of frequency transform coefficients; and

from the computing device that implements the video decoder, outputting a result of the decoding the one or more video images.

23.-24. (Cancelled)

25. (Original) The method of claim 22 wherein each of the one or more first-layer runs represents a run of zero or more zero values in the sequence.

26. (Original) The method of claim 22 wherein each of the one or more second-layer runs represents a run of zero or more zero-value first-layer runs.

27. (Original) The method of claim 22 wherein each of the one or more second-layer levels represents a single non-zero value first-layer run.

28. (Currently Amended) In a computing device that implements a video processing tool encoder, a method comprising:

with the computing device that implements the video encoder, encoding one or more video images, including, for each of plural sequences of frequency transform coefficients for the one or more video images,

processing run level information for the sequence in a two-layer representation, including processing run-level encoding one or more first-layer levels as one or more second-layer runs and one or more second-layer levels; and

from the computing device that implements the video encoder, outputting a result of the encoding the one or more video images.

29.-30. (Cancelled)

31. (Original) The method of claim 28 wherein each of the one or more first-layer levels represents a non-zero value in the sequence.

32. (Original) The method of claim 28 wherein each of the one or more second-layer runs represents a run of zero or more first-layer levels having an absolute value of one.

33. (Original) The method of claim 28 wherein each of the one or more second-layer levels represents a single first-layer level having an absolute value of two or more.

34.-67. (Canceled)

68. (Currently Amended) In a computing device that implements a video decoder, a  
A method comprising:

with the computing device that implements the video decoder, decoding one or more  
video images, including processing run level information in a two-layer representation for a  
sequence of values for the one or more video images, wherein the processing includes processing  
plural first-layer levels as run-level decoding a sequence of one or more second-layer runs and  
one or more second-layer levels representing plural first-layer levels for the sequence of values;  
and

from the computing device that implements the video decoder, outputting a result of the  
decoding the one or more video images.

69. (Currently Amended) The method of claim 1 wherein ~~the processing the run level~~  
~~information comprises encoding the run level information, and wherein the outputting the result~~  
comprises signaling the encoded run level information as part of a bit stream.

70.-71. (Cancelled)

72. (Currently Amended) The method of claim 22 wherein ~~the processing the run~~  
~~level information comprises decoding the run level information, and wherein the outputting the~~  
result comprises outputting for display one or more video pictures reconstructed based at least in  
part upon the ~~decoded run level information~~ one or more first-layer runs.

73. (Currently Amended) The method of claim 28 wherein ~~the processing the run~~  
~~level information comprises encoding the run level information, and wherein the outputting the~~  
result comprises signaling the encoded run level information as part of a bit stream.

74.-75. (Cancelled)

76. (Currently Amended) The method of claim 68 wherein ~~the processing the run~~  
~~level information comprises decoding the run level information, and wherein the outputting the~~

result comprises outputting for display one or more video pictures reconstructed based at least in part upon the ~~decoded run level information plural first-layer levels~~.

77. (New) One or more computer-readable physical storage media storing computer-executable instructions for causing a computing device implementing a video encoder programmed thereby to perform a method for encoding video, the method comprising:

with the computing device that implements the video encoder, encoding one or more video images, including processing run level information in a two-layer representation for a sequence of values for the one or more video images, wherein the processing includes run-level encoding a sequence of plural first-layer runs from the sequence of values as one or more second-layer runs and one or more second-layer levels; and

from the computing device that implements the video encoder, outputting a result of the encoding the one or more video images.

78. (New) The computer-readable physical storage media of claim 77 wherein each of the plural first-layer runs represents a run of zero or more zero values in the sequence of values.

79. (New) The computer-readable physical storage media of claim 77 wherein each of the one or more second-layer runs represents a run of zero or more insignificant-value first-layer runs.

80. (New) The computer-readable physical storage media of claim 77 wherein each of the one or more second-layer levels represents a single significant-value first-layer run.

81. (New) The computer-readable physical storage media of claim 77 wherein the method further includes processing at least some of the one or more second-layer runs using a separate Huffman code per second-layer run.

82. (New) The computer-readable physical storage media of claim 77 wherein the method further includes processing at least some of the one or more second-layer levels using a separate Huffman code per second-layer level.

83. (New) The computer-readable physical storage media of claim 77 wherein the method further includes processing a count of significant second-layer runs, wherein the count at least in part enables reduction in code table size and/or early termination of decoding.

84. (New) One or more computer-readable physical storage media containing computer-executable instructions for causing a computing device that implements a video decoder programmed thereby to perform a method for decoding video, the method comprising:  
with the computing device that implements the video decoder, decoding one or more video images, including, for each of plural sequences of frequency transform coefficients for the one or more video images,

processing run level information for the sequence in a two-layer representation, including run-level decoding one or more second-layer runs and one or more second-layer levels representing one or more first-layer runs for the sequence of frequency transform coefficients; and

from the computing device that implements the video decoder, outputting a result of the decoding the one or more video images.

85. (New) The computer-readable physical storage media of claim 84 wherein each of the one or more first-layer runs represents a run of zero or more zero values in the sequence.

86. (New) The computer-readable physical storage media of claim 84 wherein each of the one or more second-layer runs represents a run of zero or more zero-value first-layer runs.

87. (New) The computer-readable physical storage media of claim 84 wherein each of the one or more second-layer levels represents a single non-zero value first-layer run.

88. (New) One or more computer-readable physical storage media storing computer-executable instructions for causing a computing device that implements a video encoder programmed thereby to perform a method for encoding video, the method comprising:

with the computing device that implements the video encoder, encoding one or more video images, including, for each of plural sequences of frequency transform coefficients for the one or more video images,

processing run level information for the sequence in a two-layer representation, including run-level encoding one or more first-layer levels as one or more second-layer runs and one or more second-layer levels; and

from the computing device that implements the video encoder, outputting a result of the encoding the one or more video images.

89. (New) The computer-readable physical storage media of claim 88 wherein each of the one or more first-layer levels represents a non-zero value in the sequence.

90. (New) The computer-readable physical storage media of claim 88 wherein each of the one or more second-layer runs represents a run of zero or more first-layer levels having an absolute value of one.

91. (New) The computer-readable physical storage media of claim 88 wherein each of the one or more second-layer levels represents a single first-layer level having an absolute value of two or more.

92. (New) One or more computer-readable physical storage media storing computer-executable instructions for causing a computing device that implements a video decoder programmed thereby to perform a method for decoding video, the method comprising:

with the computing device that implements the video decoder, decoding one or more video images, including processing run level information in a two-layer representation for a sequence of values for the one or more video images, wherein the processing includes run-level decoding a sequence of one or more second-layer runs and one or more second-layer levels representing plural first-layer levels for the sequence of values; and

RCF:vjs 03/03/09 999287.doc 307597.01

Attorney Reference Number 3382-67641-01  
Application Number 10/826,971

from the computing device that implements the video decoder, outputting a result of the decoding the one or more video images.

93. (New) The computer-readable physical storage media of claim 92 wherein each of the plural first-layer levels represents a non-zero value in the sequence of values.

94. (New) The computer-readable physical storage media of claim 92 wherein each of the one or more second-layer runs represents a run of zero or more insignificant-value first-layer levels.

95. (New) The computer-readable physical storage media of claim 92 wherein each of the one or more second-layer levels represents a single significant-value first-layer level.

96. (New) The computer-readable physical storage media of claim 92 wherein the method further includes processing at least some of the one or more second-layer runs using a separate Huffman code per second-layer run.

97. (New) The computer-readable physical storage media of claim 92 wherein the method further includes processing at least some of the one or more second-layer levels using a separate Huffman code per second-layer level.

98. (New) The computer-readable physical storage media of claim 92 wherein the method further includes processing a count of significant second-layer levels, wherein the count at least in part enables reduction in code table size and/or early termination of decoding.